



## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification<sup>6</sup>:

H04H 1/00, H04N 7/167

A1

(11) International Publication Number:

WO 96/27958

(43) International Publication Date: 12 September 1996 (12.09.96)

(21) International Application Number: PCT/SE96/00283

(22) International Filing Date: 4 March 1996 (04.03.96)

(30) Priority Data:

9500792-8

6 March 1995 (06.03.95)

SE

(71)(72) Applicant and Inventor: EKLÖF, Krister [SE/SE]; Bastugatan 17, S-118 25 Stockholm (SE).

(81) Designated States: JP, European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).

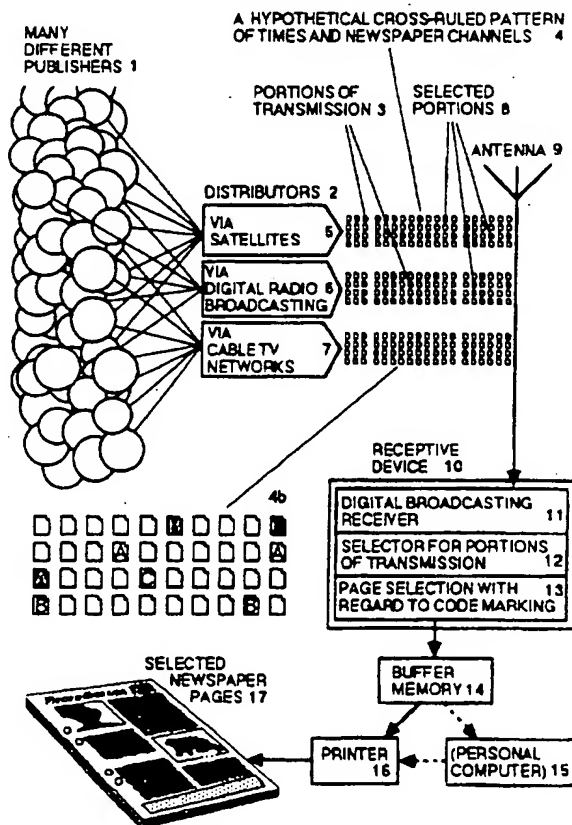
Published

With international search report.

(54) Title: A METHOD FOR TRANSMISSION AND A DEVICE FOR RECEPTION OF INFORMATION

## (57) Abstract

A system for digital broadcasting and continual automatic selection of newspaper material from many different publishers. From a special receptive device the reader gets his own personal "newspaper" consisting of selected material from several selected publishers. The material from each publisher is divided into a series of portions and these portions are transmitted, one after the other, in 2-4 copies placed on specific areas in a hypothetical, periodically repeated, cross-ruled pattern (4) of times and channels. To catch one of each of the portions from the selected publishers, the receptive device is programmed by the user to day and night alternate between different channels in a periodically repeated order. With classification and code marking of the material before it is being transmitted, the receptive device can also automatically select the most interesting material from each selected publisher.



BEST AVAILABLE COPY

**FOR THE PURPOSES OF INFORMATION ONLY**

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AM	Armenia	GB	United Kingdom	MW	Malawi
AT	Austria	GE	Georgia	MX	Mexico
AU	Australia	GN	Guinea	NE	Niger
BB	Barbados	GR	Greece	NL	Netherlands
BE	Belgium	HU	Hungary	NO	Norway
BF	Burkina Faso	IE	Ireland	NZ	New Zealand
BG	Bulgaria	IT	Italy	PL	Poland
BJ	Benin	JP	Japan	PT	Portugal
BR	Brazil	KE	Kenya	RO	Romania
BY	Belarus	KG	Kyrgyzstan	RU	Russian Federation
CA	Canada	KP	Democratic People's Republic of Korea	SD	Sudan
CF	Central African Republic	KR	Republic of Korea	SE	Sweden
CG	Congo	KZ	Kazakhstan	SG	Singapore
CH	Switzerland	LI	Liechtenstein	SI	Slovenia
CI	Côte d'Ivoire	LK	Sri Lanka	SK	Slovakia
CM	Cameroon	LR	Liberia	SN	Senegal
CN	China	LT	Lithuania	SZ	Swaziland
CS	Czechoslovakia	LU	Luxembourg	TD	Chad
CZ	Czech Republic	LV	Latvia	TG	Togo
DE	Germany	MC	Monaco	TJ	Tajikistan
DK	Denmark	MD	Republic of Moldova	TT	Trinidad and Tobago
EE	Estonia	MG	Madagascar	UA	Ukraine
ES	Spain	ML	Mali	UG	Uganda
FI	Finland	MN	Mongolia	US	United States of America
FR	France	MR	Mauritania	UZ	Uzbekistan
GA	Gabon			VN	Viet Nam

**A method for transmission and a device for reception of information.**

The invention offers a method for transmission of information in digital signal form and a corresponding device for  
5 reception.

More exactly, the invention concerns a system for general distribution, reception and automatic selection of information, such as for example newspaper material with text and pictures for print outs in printers. The information in this system can be  
10 transmitted from a multitude of various publishers to anyone who is interested. The transmission can be done via satellites, cable TV networks, and digital radio broadcasting.

One purpose of this invention is to make it possible to efficiently use a limited signal space for economical transmission  
15 of newspaper material around the clock, via for example digital radio broadcasting and thereby making room for many different publishers.

Another purpose of the invention is to give the user/reader a new kind of personally assembled and concentrated newspaper,  
20 for example in the shape of ready made newspaper pages, in the A4-format, which are automatically being selected day and night from a very large body of material and from a number of different publishers. The selected pages may come from a mixture of large and small publishers with various specialities, from the  
25 nearest village as well as from the other side of the globe.

One difficulty with the automatic collection of material from many different publishers transmitted via different channels, is the risk that several channels might simultaneously transmit material which could be interesting to the user/reader, so that the  
30 receptive device for that reason would simultaneously have to watch, i.e. receive, select, and store material from several

different channels.

The central idea in this invention is to distribute the newspaper material or any other kind of information, divided into series of portions with enough room for for example 5 newspaper pages in each portion and with these portions placed on special places in a periodically repeated, hypothetical cross-ruled pattern of times and newspaper channels. In this way, a special receptive device can be programmed by the user/reader to receive all the transmission portions from the desired series by connecting different newspaper channels in a periodically repeated order.

All the information portions in one such series are related in some way, usually by coming from one and the same publisher.

Special distribution companies handle the distribution of several series of transmission. The portions in one series are normally transmitted in for example 3 identical copies which are placed on specific areas in the cross-ruled pattern.

The time division in the cross-ruled pattern can for example mean that a 24-hour long period is divided into 48, half hour transmission periods all starting every hour or half hour and which each, on each channel, has room in time for, for example 10 or 20 consecutive transmission portions in particular portion areas.

The idea with the cross-ruled pattern is always to find a new portion from the same series of transmission portions in each transmission period on a certain square in the pattern, i.e. on a particular newspaper channel and in a specific portion area in time.

In this way, the receptive device can automatically and in turn, catch all the portions, in those series of transmission portions, which interest the reader. A large amount of different

publishers can thereby reach their own interested readers with new material once every transmission period, without having to repeat the newspaper material of the entire 24-hour period as often.

5       A technique of modulation which, in the manner described, is particularly suitable for transmission of newspaper material is called COFDM which stands for Coded Orthogonal Frequency Division Multiplex. The technique means that one uses a large amount of conducting waves, all phase modulated and handling  
10       one data channel each. Out of the common data flow, from a multitude of such conducting waves, different channels with desired data speeds for, for example sound broadcasting or newspaper distribution, can then be extracted.

      In order to radio broadcast digital sound in stereo, one  
15       initially plans to use a data speed which is 256 or perhaps 224 kbit/s. In order to transmit newspaper pages via digital broadcasting according to the present invention, a considerably lower data speed, for example 16 kbit/s for each newspaper channel, is enough, thanks to the automatic selection day and  
20       night.

      In this way, there is enough room for, for example 14-16 different newspaper channels, side by side in a signal space, which only corresponds to the space used for an ordinary digital radio broadcasting channel for stereo sound.

25       A receptive device which collects all material from for example ten selected publishers around the clock, would give a reader more information of all kinds than an average person has time, energy or inclination to sift through each day.

      Furthermore, if one should search for such an amount of  
30       information on a screen, a very large computer memory would also be necessary in order to save all the information, particularly

so in case the reader for example wants to keep it for a week, in order to make a real effort to get the time to find the most interesting parts some other day, before they have been deleted, to make room for all the new material which is continuously  
5 flowing in.

In short, it is necessary to combine the aforementioned new technique, i.e. the technique with portions of transmission in a cross-ruled pattern of different newspaper channels and times, with another technique suitable for an automatic and more  
10 detailed elimination of that which the user/reader will probably not spend time and effort on, on a daily basis.

In order to make such an automatic sorting possible, the aforementioned technique can be combined with a known technique to select information of some kind, which has been  
15 furnished with an identification code.

Referring to this particular invention, this means that before being transmitted all material should be classified and marked with regard to its contents using special codes of identification, related to corresponding material as for example a newspaper  
20 page with text and pictures. Each newspaper page can be marked with several different codes all reflecting the contents of the page to some extent.

The receptive device can then, by reading the codes, automatically and immediately at the reception, in detail select  
25 the newspaper material which might be of interest to the user/reader from the selected portions of transmission. It need only compare the transmission codes with codes that the user/reader has programmed into a code memory in the receptive device. Only pages with a code that corresponds to one of the  
30 programmed ones will be saved, i.e. printed out and/or stored in a memory. The rest of the pages will be ignored.

With regard to the automatic sorting of the contents in the selected portions of transmission, it is possible to combine at least two different main types of codes in various ways. Codes of one type can remain in the memory as long as the reader desires, so that all material which day after day is being transmitted with the corresponding code, is selected and saved.

A code of the other main type works in such a way that it is being automatically deleted from the code memory when material with a corresponding code has been received. The user/reader can use this latter type of code to "order" single articles or advertising pages, which he or she already knows should be transmitted and how they are marked. A small advertisement can for example refer to a particular code on a more detailed advertising page, which perhaps has a discount coupon or any other kind of tempting offer. An advantage in transmitting pages marked with this kind of "one-time-codes" is, that they can be rerun without perhaps millions of readers getting a duplicate printed in their printers. In order to separate the different types of codes, one can for example add a letter before a digital code.

Enormous amounts of information from many different publishers throughout the world can automatically, day and night, be searched by the reader's receptive device through the combination of: on the one hand, the new technique of previously mentioned series of portions of transmission placed in certain areas in a hypothetical cross-ruled pattern of times and newspaper channels, and on the other hand, a known technique for the sorting of information with the help of identification codes. Thus, the reader can program his receptive device so that he or she receives an all-together personal and concentrated daily newspaper from the full material of many competing publishers.

With this particular invention, new material can be automatically received at any time, so that the signal space can be efficiently and economically used, day and night. In this way, there will be room for a large amount of different publishers, who  
5 can get their newspaper material economically distributed even across large geographic areas. Local newspapers can be distributed throughout a whole country. Wide-spread newspapers can be distributed in an entire part of the world, or even globally.

10 Several publishers, who only produce a small number of pages per week, can share the space in a series of portions of transmission. A single large publisher perhaps needs more than one series of portions of transmission in order to get room for all his material.

15 The invention will be explained more in detail in the enclosed patent requirements, and further characteristics and advantages will be clear from the following description of a mode of execution of the system with reference to the enclosed schematic figure.

20 The main figure shows an example of how information, as for example newspaper pages, can be distributed from many different publishers directly home to the reader, by using this system.

Many different publishers (1) deliver their material portion-  
25 wise in series of portions which each contains for example 5-10 newspaper pages.

A new portion in such a series is for example delivered every half hour to a particular company of distribution. Each company of distribution or distributor (2) preferably takes care of the  
30 transmission of the material from a large amount of different publishers. A new portion of transmission (3) from a publisher is



placed by the distributor, normally in several different, for example 2-4 fixed areas, in a periodically, for example every half hour repeated, hypothetical, cross-ruled pattern (4) of times and newspaper channels, where it is being transmitted to the readers  
5 via for example satellites (5), digital radio broadcasting (6), or cable TV networks (7).

Within a transmission period, there are a number of fixed areas in time, portion areas, for the transmission of a portion of transmission on each channel. In the example in the figure, a  
10 cross-ruled pattern is shown, where each transmission period has been divided up time-wise, so that it has 10 portion areas.

One part of the same cross-ruled pattern, on a larger scale (4b), shows four newspaper channels during a transmission period.

15 It is shown here how one and the same portion of transmission, for instance "A", from a certain series of portions of transmission, is normally found in several, for example 3, different areas of portions within the period of transmission. In this way, the risk is small that those series of transmission periods  
20 which are the most interesting to the reader will only be transmitted simultaneously with other interesting series of portions of transmission, so that the reader would be forced to select only one of these.

The portions of transmission marked in black (8) represent an  
25 example of how those portions of transmission which are the most interesting to the reader, can be placed in the cross-ruled pattern during each broadcasting period.

An antenna (9) of some kind catches the transmitted information and conveys it further to a particular receptive  
30 device (10). The receptive device consists of a digital broadcasting receiver (11), a selector for portions of transmission that can be

programmed (12), and devices for choice of pages with regard to code marking (13).

The selector for the portions of transmission works in a similar way to that of a programmable channel selector common in VCRs, i.e. it can select one channel at a time which is received between certain chosen points in time. The difference is however, that this particular selector can be programmed by the user to continuously alternate between different channels in an order that is being periodically repeated.

It is important that the transmission periods on the various channels begin simultaneously, so that even the portion-areas on different channels thereby correspond to each other in time. It is practical to have a short break in transmission of at least 2-3 seconds between the portion-areas in order to allow for the alternations of channels by the receiver and to make room for small unintentional time differences that for instance can occur between satellite channels and channels transmitted via digital broadcasting.

When a selected portion of transmission reaches the receptive device, the identifying codes in the portion are compared to the codes the reader has entered into a particular code memory in the receptive device. This code memory can preferably be subdivided into various parts belonging to the different portion-areas, so that an identifying code in the code memory, referring to a certain series of portions of transmission, will not be mixed up with a code which refers to material from another series. As an alternative to separate code memories in the receptive device, the distributors can allot a certain specific group of identifying codes to each publisher. If one for example uses five digit codes, then 500 different series of portions of transmission can have access to 200 codes each.

Those pages which the receptive device has selected can be forwarded to a printer (16) to be printed out to complete newspaper pages (17). In this system, it is not necessary for the reader to have a personal computer connected to it, but selected newspaper pages, or any other kind of information, can also be directed to the memory in a personal computer (15), where the reader / user for example can access the contents, via a screen.

A buffer memory (14) can temporarily store selected information in order to thereafter forward it in a pace suitable to the printer or the personal computer. The buffer memory can preferably be built in as a part of the receptive device.

The invention can naturally be altered in various ways within the framework of the patent requirements.

## PATENT REQUIREMENTS.

1. A method for transmission of information, as for example some kind of newspaper material with text and pictures in digital signal form, via for instance satellites, cable TV networks, or  
5 digital radio broadcasting, from one or several different publishers to anyone who is interested, **characterised by the following:** information which belongs together, for instance in such a way that it comes from one and same publisher, is being subdivided into a series of small portions, which each contains for  
10 example 5-10 newspaper pages in the A4 format and that each such portion of transmission, belonging to one and the same series, is being transmitted in several, for example 3, identical issues placed on fixed spots, within a predetermined time range, for example every whole- or half hour, periodically repeated,  
15 hypothetical, cross-ruled pattern, in which the squares in one direction are divided up by different newspaper channels and in the other direction by time division, common to the various channels, which mean that each period of transmission has particular spots in time for a certain amount, for example 10  
20 dosages, of transmission one after the other on each newspaper channel.

2. A method for transmission of information according to requirement no.1, **characterised by the following:** the information is being classified before the transmission with regard to the  
25 contents and is being furnished with different suitable codes of identification for automatic sorting by the receiver, and these codes of identification are being transmitted in connection with corresponding information.

3. A method for transmission of information according to  
30 one of the preceding requirements, **characterised by the following:** the information is being transmitted with so called

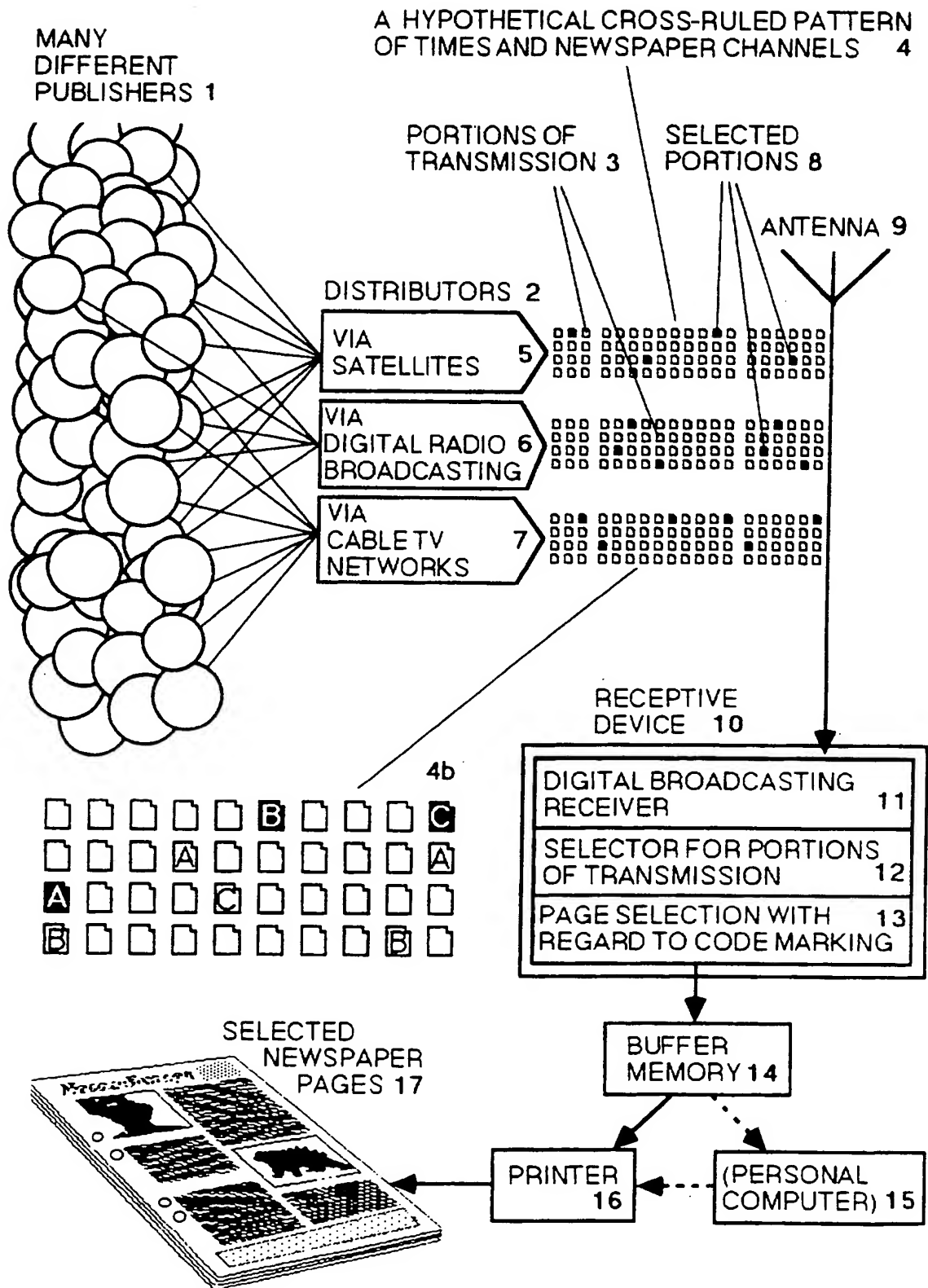
COFDM modulation, Coded Orthogonal Frequency Division Multiplex.

4. Device for reception of information, as for example some kind of newspaper pages with text and pictures, comprising  
5 a receiver for digital transmissions of radio broadcasting, or for similar kinds of transmissions via for example. satellites and cable TV networks, equipped with a channel selector, **characterised by the following:** the channel selector can be programmed by the user/reader to turn on and off various  
10 channels automatically at certain points in a periodically, for instance every half hour, repeated order which the user/reader himself has chosen.

5. Device according to requirement no. 4 for reception of information, **characterised by the following:** on the one hand, it  
15 has at least one particular memory for code storage of the kind referred to in requirement no. 2, and also on the other hand, it has devices for reading and comparing of codes received with those ones that have been entered in pre mentioned memory.

6. Device according to requirements no. 4 or 5 for reception  
20 of information, **characterised by the following:** the receiver of digital transmissions of broadcasting is equipped in such away that it extracts different newspaper channels from a flow of data that is being forwarded with so called. COFDM modulation.

---



1  
INTERNATIONAL SEARCH REPORT

International application No.

PCT/SE 96/00283

## A. CLASSIFICATION OF SUBJECT MATTER

IPC6: H04H 1/00, H04N 7/167

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC6: H04H, H04N, G06F, H04L, H04M

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 0621718 A1 (SONY CORPORATION), 26 October 1994 (26.10.94), abstract --	1-6
A	US 4361848 A (ALAIN POIGNET ET AL), 30 November 1982 (30.11.82), abstract --	1-6
A	WO 9315466 A1 (RAYCHEM CORPORATION), 5 August 1993 (05.08.93), abstract -- -----	1-6

☐ Further documents are listed in the continuation of Box C.☒ See patent family annex.

## \* Special categories of cited documents:

\*A\* document defining the general state of the art which is not considered to be of particular relevance

\*E\* earlier document but published on or after the international filing date

\*L\* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

\*O\* document referring to an oral disclosure, use, exhibition or other means

\*P\* document published prior to the international filing date but later than the priority date claimed

\*T\* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

\*X\* document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

\*Y\* document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

\*&amp;\* document member of the same patent family

Date of the actual completion of the international search

5 June 1996

Date of mailing of the international search report

13 -06- 1996

Name and mailing address of the ISA/  
Swedish Patent Office  
Box 5055, S-102 42 STOCKHOLM  
Facsimile No. +46 8 666 02 86

Authorized officer

Marcus Wik  
Telephone No. +46 8 782 25 00

## INTERNATIONAL SEARCH REPORT

Information on patent family members

01/04/96

International application No.

PCT/SE 96/00283

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
EP-A1-	0621718	26/10/94	NONE	
US-A-	4361848	30/11/82	BE-A, A- 877604	05/11/79
			DE-A, C- 2740329	16/03/78
			DE-C- 2760394	22/12/88
			DE-C- 2760395	25/02/88
			FR-A, B- 2363949	31/03/78
			FR-A, B- 2365843	21/04/78
			GB-A- 1593423	15/07/81
			JP-C- 1495333	16/05/89
			JP-A- 53105113	13/09/78
			JP-B- 63042908	26/08/88
			NL-A- 7802974	24/09/79
			US-E- RE32187	17/06/86
			US-A- 4213124	15/07/80
			BE-A, A- 877603	05/11/79
WO-A1-	9315466	05/08/93	CA-A- 2127698	05/08/93
			EP-A, A- 0624268	17/11/94
			JP-T- 7505028	01/06/95



**This Page is Inserted by IFW Indexing and Scanning  
Operations and is not part of the Official Record**

## **BEST AVAILABLE IMAGES**

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images include but are not limited to the items checked:

- ☐ **BLACK BORDERS**
- ☐ **IMAGE CUT OFF AT TOP, BOTTOM OR SIDES**
- ☒ **FADED TEXT OR DRAWING**
- ☒ **BLURRED OR ILLEGIBLE TEXT OR DRAWING**
- ☐ **SKEWED/SLANTED IMAGES**
- ☐ **COLOR OR BLACK AND WHITE PHOTOGRAPHS**
- ☐ **GRAY SCALE DOCUMENTS**
- ☐ **LINES OR MARKS ON ORIGINAL DOCUMENT**
- ☐ **REFERENCE(S) OR EXHIBIT(S) SUBMITTED ARE POOR QUALITY**
- ☐ **OTHER:** \_\_\_\_\_

**IMAGES ARE BEST AVAILABLE COPY.**

**As rescanning these documents will not correct the image problems checked, please do not report these problems to the IFW Image Problem Mailbox.**

**THIS PAGE BLANK (USPTO)**